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AMSAT NEWS SERVICE
ANS-022

ANS is a free, weekly, news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

Please send any amateur satellite news or reports to:
ans-editor@amsat.org

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ANS-015 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 022.01
From AMSAT HQ SILVER SPRING, MD.
January 22, 2012
To All RADIO AMATEURS
BID: $ANS-022.01

Fox-1: Solar Panel Campaign

As AMSAT embarks on the Fox-1 Project, here is an opportunity to literally put your callsign on the Fox hardware. AMSAT is looking for major donations to help underwrite the cost of solar cells/ panels, one of the more significant expenses of the project. These solar cells are needed for the flight unit as well as for the a flight spare. As Fox-1 will have solar cells on all six sides of the spacecraft and given the relatively small surface area avail- able on each side (at most 4" by 4" per side), AMSAT will invest in high efficiency solar cells to gain as much power as possible to operate the spacecraft.

Complete details on how you can donate are posted on the web:
http://www.amsat.org - the top news item.

AMSAT President Barry Baines, WD4ASW, said, "We highlighted at the recent 2011 Symposium that AMSAT is actively developing Fox-1, a new spacecraft that is designed to replace AO-51. Fox-1 development now takes on a great sense of urgency."

AMSAT Vice-President of Engineering, Tony Monteiro, AA2TX says,
"Fox-1 will advance single-channel FM repeater satellite operation
beyond the experience of AO-51. It will advance AMSAT to the next
generation of AO-51 class satellites."

Fox-1 is designed for longer operational life with these features:

+ Fox-1 is designed to operate in sunlight without batteries once
  the battery system fails. This applies lessons learned from AO-51
  and ARISSat-1 operations.

+ In case of IHU failure Fox-1 will continue to operate its FM
  repeater in a basic, 'zombie sat' mode, so that the repeater
  remains on-the-air.

+ Fox-1 is designed as the immediate replacement for AO-51. Its U/V
  (Mode B) transponder will make it even easier to work with modest
  equipment.

+ From the ground user's perspective, the same FM amateur radio
  equipment used for AO-51 may be used for Fox-1.

+ Extending the design, Fox-2 will benefit from the development work
  of Fox-1 by adding more sophisticated power management and Software
  Defined Transponder (SDX) communications systems.

Barry concluded, "AMSAT's ability to provide a replacement spacecraft
and get it launched is dependent upon the active support of donors who
wish to see Fox-1 fly."

Several opportunities to make your donation to keep amateur radio in
space include:

+ Return the form sent with the letter to reply with your donation
  for the Fox-1 Project.
  - All donations over $40 will receive a Fox pin.
  - Donations of $120 or more qualify you for AMSAT President's Club

+ Call Martha at the AMSAT Office +1-888-FB AMSAT (1-888-322-6728)
+ Paypal donation widget on the main page at: http://www.amsat.org
+ Paypal donation widget for Project Fox at:
  http://www.amsat.org/amsat-new/fox/
+ You can also go to the Paypal site and send your donation to
  martha@amsat.org.
+ The AMSAT Store: http://www.amsat-na.com/store/categories.php

Project Fox web site provide a good overview of the technical progress
of the new satellite: http://www.amsat.org/amsat-new/fox/

[ANS thanks AMSAT President Barry Baines, WD4ASW, and AMSAT's Project
Fox Engineering team for the above information]

Amateur Radio Help Needed for RS-39 Deployment on January 24

The Chibis-M satellite,RS-39 is planned to be deployed from the Pro-
gress M-13M cargo ship into a 500 km orbit on January 24 at approxi-
mately 23:00-23:59 UTC.

RS-39 has CW beacons on 435.315 and 435.215 MHz that can be received
directly by radio amateurs and schools for educational outreach pur-
poses. Telemetry will be transmitted on these downlink frequencies.

The RS-39 Morse Code telemetry format is available as an MS-Word document from: http://tinyurl.com/RS-39-Morse-Code-Telemetry

The RS-39 team is requesting support from amateur radio operators for any reception reports of Chibis-M. Special attention is needed during the first orbits as these are outside the range of control stations. Each report will be confirmed by special QSL card.

The Space Research Institute of the Russian Academy of Sciences (RAS) will activate an e-mail address for radio amateurs around to send reception reports. The http://chibis.cosmos.ru/ link is in Russian at present. (http://tinyurl.com/RS-39-Chibis-M is available in google English.)

Chibis-M arrived at the ISS on November 2, 2011 aboard the Progress M-13M cargo craft. It has been studying Terrestrial Gamma Ray Flashes which are hypothesized to be produced by beams of very energetic electrons, accelerated in the intense electric fields generated by large thunderstorm systems.

On January 23, 2012 Progress M-13M will undock from the ISS. Progress will then perform two orbital maneuvers to raise its orbit to 500 km. On January 24 Chibis-M will separate from the Progress cargo craft.

RS-39 also carries receivers listening between 0.1 - 40 kHz and 26-48 MHz for a space weather experiment.

Additional information can be found on these links:
http://www.uk.amsat.org/3910
http://www.energia.ru/en/iss/researches/geophis/19.html

[ANS thanks Trevor, M5AKA and AMSAT-UK for the above information]

SKN on OSCAR 2012 Best Fist Nominations Due

Many thanks to all who participated in AMSAT's Straight Key Night on OSCAR 2012. If you have not already done so, please take a moment to nominate someone you worked for Best Fist. Remember, your nominee need not have the best fist of those you heard, only of those you worked. Send your nomination to w2rs@amsat.org.

This year's event is dedicated to the memory of Don Brown, W1JSM, who passed away in 2011, aged 90. Don was a longtime, enthusiastic VHF/UHF and satellite operator, and one of our most frequent Best Fist winners.

Those nominated will be recognized in an ANS bulletin in early February, and in The AMSAT Journal.

[ANS thanks Ray Soifer, W2RS for the above information]

University of Liege Students Provide Update on OUFTI-1 D-Star Cubesat

The OUFTI-1 Newsletter, published by students at the University of Liege, Belgium reports they plan to have their D-Star transponder cubesat launched toward the end of 2012. The satellite will have up-

links in the 145 MHz band and downlinks on 435.015 and 435.045 MHz.

Subsystem status reports are written up on the following:

+ The components of the Attitude Control System were ordered and received. Two sets of one permanent magnet and four hysteretic rods are waiting for integration of engineering and flight models.

+ The Electrical Power Supply subsystem has its main functionalities implemented and tested. Some secondary functions, such as USB battery charger, are still to be implemented.

+ The antenna deployment mechanism subsystem was tested at Centre Spatial de Li�ge (CSL) last June. The tests were performed under vacuum at low (-60�C) and high (+60�C) temperatures. The tests proved the correct functioning of the system but it was also noticed that the deployment of the antennas could be blocked by a remaining part of the retention wire. This problem is currently being investigated in order to improve the design and guarantee the deployment.

+ The Communication subsystem is complete. Regarding the radio-frequency part (mainly amplifiers), some tests were performed on the receiver circuit and showed that improvements were needed. The transmitter circuit will be designed by Audric Hay (HELMO-Gramme). He will also integrate and test the whole subsystem.

+ The On-Board Computer software was coded and tested. This year, Alexei Dick (HEPL-INPRES) will develop a mode for pre-flight tests of the satellite.

+ Thermal Analysis showed that the system could not keep batteries above 0�C. The thermal control system was complemented with polymer insulators. Testing in June at CSL demonstrated this new solution worked.

+ The vibrational behavior of OUFTI-1 during launch was studied thanks to a detailed finite-element model. Gilles Bodson (HELMO-Gramme) will keep this model up-to-date and perform tests on the engineering model.

+ The Ground Station hardware is operational at the Montefiore Institute. The station is regularly used for satellite tracking. Alain Collette (HELMO-Gramme) will develop the Mission Control Software.

The OUFTI-1 team is planning for a launch towards the end of 2012. Opportunities have been identified and discussions are ongoing with a launch provider.

[ANS thanks the OUFTI-1 Newsletter for the above information]

More University Cubesat Projects Rolling Out

Japan: ITF-1 (YUI) CubeSat

Students at the University of Tsukuba are working on the ITF-1 (YUI) CubeSat project that is planned to be launched on a H-IIA rocket in 2013. The orbit will be 400 km by 350 km with an inclination of 65 degrees.

The formal name ITF-1 comes from the initial letter of the university slogan "Imagine The Future". The satellite also has a popular name YUI which means "bond" in Japanese, it came from the project's concept "Creating the Worldwide Human Community".

The 435MHz satellite beacon will send telemetry by a Morse Code audio tone on an FM transmitter running 300 milliwats output. It should be possible to receive it using simple equipment such as a handheld transceiver or scanner. Telemetry information will be first compressed into binary data and then cut into 5 bits and converted into 10 - 15 Morse code messages.

Reception reports will be acknowledged with a certificate and the telemetry will be made available on the web.

The UTF-1 Project Manager is Ayano Okamura and you can read her blog: http://tinyurl.com/ITF-1-ProjectManagerBlog

The Chief Tech blog by Asai Eisuke is at: http://tinyurl.com/ITF-1-TechBlog

ITF-1 website in Google English http://tinyurl.com/CubeSat-ITF-1
AMSAT-UK posted this news at: http://www.uk.amsat.org/3809

Spain: Xatcobeo

Students at the University of Vigo in Spain have built Xatcobeo a CubeSat that carries a Software Defined Radio (SDR) and a solar panel deployment mechanism. A launch on an ESA Vega rocket in February is planned.

The IARU Amateur Satellite Coordination Panel pages report that it carries three payloads:

+ SRAD: a Software Defined Radio. The aim is to test under space conditions a reconfigurable radio. Different modulation schemes will be selected depending on the link conditions.

+ RDS: an ionizing radiation dosimeter. This dosimeter will take measurements of ionizing radiation in a typical LEO orbit for amateur satellites, thus increasing our knwoledge about radiation conditions in this environment.

+ PDM: a solar panel deployment mechanism to be tested in-flight.

Xatcobeo plans to use FFSK with AX.25 on UHF. These frequencies have been coordinated - Simplex 437.365 MHz and SSR downlink on 145.940 MHz.

Further info available at http://www.xatcobeo.com/ and a video at: http://www.youtube.com/watch?feature=player_embedded&v=UmLhA7ioE

Pakistan: ICUBE-1 CubeSat

Students at the Institute of Space Technology (IST) built Pakistan's first CubeSat ICUBE-1. Like a number of new CubeSats its communications subsystem is capable of acting as an "AO-16 mode" FM to DSB transponder.

The IARU amateur satellite frequency coordination panel pages say that the VHF downlink will operate as a 1k2 BPSK beacon but has the capability of being configured as an FM-DSB transponder. A downlink on 145.947 MHz and an uplink on 435.060 MHz have been coordinated.

It is planned to have an imaging payload with a small low resolution CMOS sensor. The camera will be mounted on the Z+ face of the ICUBE and can take continental scale images.

ICUBE-1 is scheduled to be launched by Interorbital Systems.

ICUBE http://www.icube.org.pk/
Student Satellite Project http://www.ist.edu.pk/student_satellite.html
Institute of Space Technology (IST) http://www.ist.edu.pk/

[ANS thanks the student cubesat teams and AMSAT-UK for the above information]

NASA Launches STEM connector Website

The new STEMconnector website launched on Nov. 30, 2011. This new website serves as a national gateway to "who is doing what" in science, technology, engineering and mathematics, or STEM.

STEMConnector is a nationwide collaboration of companies, nonprofit associations and professional societies, STEM-related research and policy organizations, and academic institutions concerned about the plight of STEM education in the United States.

STEMConnector is designed to link "all things STEM" by constructing a comprehensive website that provides connections to national, state and local STEM entities and their own content through a variety of search tools.

Visit the new site to find state-by-state information, a blog, events and resources related to STEM: http://www.stemconnector.org/

[ANS thanks NASA Education Express for the above information]

Satellite Shorts From All Over

+ Bob McGwier N4HY has made available an extensive collection of amateur radio satellite pictures available for download. The pictures range from the early 1960?s with OSCAR's 1, 2, 3, etc. to the more recent Eagle and SuitSat: http://n4hy.smugmug.com/AMSAT

+ AMSAT Director of Awards, Bruce Paige, KK5DO wrote, "If you remember the photos a few weeks ago KC9ROI braving the cold to work ARISSat-1, I thought that was pretty neat and I had to get a Satellite Communicators Club Certificate to him and what better way than at one of his club meetings. I sent the certificate out the next day for a meeting they had Saturday, January 14. They framed the certificate and presented it to him." Photos posted on the club website, see: http://www.n9xh.org/

+ The 15th Annual Southeastern VHF Society Conference to be held in Charlotte, NC. on April 20-21, 2012. Papers and presentations are solicited on both the technical and operational aspects of VHF, UHF and Microwave weak signal amateur radio. The deadline for the

submission of papers and presentations is February 17, 2012. The technical program is being handled by Robin Midgett, K4IDC. Send all questions & comments to Robin via: K4IDC at comcast dot net. Also refer to SEVHFS web pages at: http://www.svhfs.org/

+ VE7DAO/VA7ISS posted a video recorded during the final days of ARISSat-1/KEDR: http://tinyurl.com/ve7dao

+ The FUNcube amateur radio satellite project is featured on the website of Electronics Weekly: http://tinyurl.com/6twqvny

+ A visualization of the launch and deployment of 50 Cubesats in the QB50 project can be seen at: http://www.youtube.com/watch?v=s7nKVhjs4

+ The European Southern Observatory posted a video of a zoom sequence beginning at Earth, past the stars in our galaxy, and on to the center of the Milky Way galaxy in the constellation of Sagittarius: http://www.youtube.com/watch?v=HUNvEKUY8

+ Clint Bradford, K6LCS has been granted permission to reprint the QST article, "A 2 meter and 70 cm Portable Tape Measure Beam" by John Portune, W6NBC: http://www.work-sat.com/Work-Sat/Antennas_files/W6NBC-Beam.pdf

Clint also has permission to reprint, "QRP to the ISS" by Doug Cook, KD5PDN, which appeared in the February, 2012 issue of QST. Doug walks the reader through building a simple tape measure beam, and how to successfully work the ISS with it and a handheld radio: http://www.work-sat.com/Work-Sat/Sat_Skeds_files/QRP-ISS_2.pdf

+ Congratulations to Ted, K7TRK on receiving VUCC Award #226. Ted commented, "My thanks to all who contributed with contacts and cards. Most of the blame goes to John, K8YSE, who got me started on the venture and to Loren, K7CWQ for continuing encouragement and advice."

+ A video by Doug Cook, KD5PDN, showing how to set up a Yaesu VX-8R for ISS APRS packet data sending and receiving and other aspects to make a digital contact with the International Space Station can be viewed at: http://www.youtube.com/watch?feature=player_embedded&v=S3EqRooN8

Winners in the ARISSat-1/KEDR Chicken Little Contest

The Chicken Little Contest received 77 entries from 17 different countries, and all continents except Antarctica. Based on comments sent along with the submissions, a wide variety of techniques were used. These ranged from detailed calculations, to comparisons with past satellites, to guesses based on birthdays.

The winners in each category are:

+ Kindergarten through grade 8: Cora Haefner, KK4ECV, Fort A.P. Hill, VA, USA

+ High School, grades 9 through 12: Cameron, Lancashire, UK

+ Adult: Thomas Frey, HB9SKA, Birr, Switzerland

Cora, KK4ECV and Thomas, HB9SKA were both within 15 hours of the best data we have from Space Track: approximately 0700 on 4 January 2012, in the South Atlantic.

All three winners have received an appropriate Chicken Little Certificate, and the congratulations of the ARISSat-1/KEDR Team. Thanks go to all those who entered, and especially educators who worked with students.

[ANS thanks the Alan Biddle, WA4SCA and the ARISSat-1/KEDR Team for the above information]

Winners of the ARISSat-1/KEDR Grab the Last Telemetry Contest

Thanks to the dedication of stations around the world, a nearly steady stream of digital telemetry reports were received in the final days from ARISSat-1/KEDR:

31 Dec -- 1125
01 Jan -- 1537
02 Jan -- 1541
03 Jan -- 1048
04 Jan -- 107

Many other reports were received from stations copying the voice, SSTV, and telemetry transmissions, as well as some contacts through the transponder.

The final digital data received was copied by both JA8TCH, Mori Seiji, Sapporo City, Japan, and JA0CAW, Tetsurou Satou, Niigata City, Japan. It was received at 06:02:14, 4 January, 2012, less than an hour before the estimated point of loss in the South Atlantic. Their data, combined with the submissions of many others, constitutes the most comprehensive coverage of the reentry of any amateur satellite. JA8TCH and JA0CAW will receive a certificate for their achievement. They and all who submitted telemetry throughout the ARISSat-1/KEDR mission have the thanks of the entire team.

[ANS thanks the Alan Biddle, WA4SCA and the ARISSat-1/KEDR Team for the above information]

Amateur Radio on the International Space Station (ARISS) Status Report
January 16, 2012

1. Upcoming School Contact

Vrije Technische Scholen (VTS), located in Sint-Niklaas, Belgium has completed (ARISS) contact on Wednesday, January 18 at 09:47 UTC. VTS is a technical and professional secondary school for students ages 12 - 18. Lesson plans associated with this contact have been adapted for the different age and skill levels of the students and cover electricity, mechanics, antennas and space.

2. Burbank Participates in ARISS Contact with Descartes High School

Descartes High School in Montigny-Le-Bretonneux, France participated in an Amateur Radio on the International Space Station (ARISS) contact with

Dan Burbank, KC5ZSX on Monday, January 9. Burbank talked about how astronauts from different cultures get along on the ISS and fielded questions about the various experiments performed onboard the Space Station. About three hundred students and visitors were present for the event, including Astronaut Leopold Eyharts who exchanged greetings with Burbank. Presentations were given before the contact and a Question and Answer session followed. The ARISS contact was a featured activity for students who have been studying life and work on the ISS and through collaboration with the town's amateur radio club, have also been learning about radio and wireless technology. NASA has posted video of the event on its Web site. See:
http://www.nasa.gov/multimedia/videogallery/index.html?media_id84835
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3. Belgian Students Radio Andre Kuipers

On Friday, January 13, an Amateur Radio on the International Space Station (ARISS) contact was held between students from Atheneum Borgloon in Belgium and Astronaut Andre Kuipers, PI9ISS on the ISS. The radio connection was provided by telebridge station K6DUE in Greenbelt, Maryland. The ARISS event highlighted a science curriculum covering the history of space travel, the solar system and the ISS. Other activities included space workshops and a field trip to the Eurospace Center in Transinne. Approximately 100 people tied into the contact through streaming video on the internet.

4. ARISS Contact Article in Canadian Magazine

The January/February 2012 issue of the Canadian Amateur Magazine (TCA) has a great article on an ARISS contact held in Thetford Mines, Qu�bec on November 14, 2011. The contact was arranged by a fourteen year old at the school. The story, written by ARISS Delegate Maurice-Andr� Vigneault, VE3VIG, is titled, "Quebec Youth Masters ISS Contact." A photo and the table of contents may be viewed at:
http://www.rac.ca/tca/

5. KPARC ARISS Presentation

ARISS volunteer Dave Jordan, AA4KN gave a talk on the ARISS program during the Sun City, Florida Kings Point Amateur Radio Club (KPARC) monthly meeting on January 9. His presentation covered basic operations of the ARISS organization, a brief history of ARISS beginning with SAREX and a section discussing the ARISSat-1 mission during which he showed released photos and others that illustrated the assembly, testing and general development efforts that took place in the Orlando lab. In concluding his talk, Jordan suggested that the club members form a group to meet with local schools and encourage them to submit proposals for future ARISS contacts. Some photos from the presentation are available here: http://www.kparc.org/archive/aa4kn.htm

6. Astronaut Training Status

Astronaut Alexander Gerst is interested in earning his amateur radio license and will be participating in training sessions in February. He is scheduled to fly with Expedition 40 in May 2014.

[ANS thanks Carol, KB3LKI, for the above information]

/EX

In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits.

Application forms are available from the AMSAT Office.

73,
This week's ANS Editor,
Dee Interdonato, NB2F
Nb2f at amsat dot org